CLAIMS

1.   A thermal control and management system for a microdisplay comprising

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a temperature sensor system for measuring and generating a temperature measurement signal; and

a data processing means having a voltage database for
10   receiving and processing said temperature measurement signal by employing said voltage database to generate a temperature-dependent reference voltages for operating said microdisplay system most suitable for said temperature measurement signal.

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2.   The thermal control and management system of claim 1 wherein:

said data processing means generating a temperature-dependent black state voltage and a white state voltage as
20   said temperature-dependent reference voltages most suitable for said temperature measurement signal.

3.   The thermal control and management system of claim 1 wherein:

25   said data processing means further includes control register for loading and reading said temperature measurement signal.

4.   The thermal control and management system of claim 1
30   wherein:

said data processing means further includes digital-to-analog converter (DAC) output circuits for outputting said temperature dependent reference voltages.

5.   The thermal control and management system of claim 1 wherein:

said data processing means further includes an interpolation means for interpolating between two data in said database for generating said temperature dependent reference voltages.

6.   The thermal control and management system of claim 1 wherein:

said temperature sensor system further includes a temperature senor embedded in said microdisplay.

7.   The thermal control and management system of claim 1 wherein:

said temperature sensor system further comprising a PTAT temperature senor system.

8.   The thermal control and management system of claim 1 wherein:

said data processing means further includes an additional cooling activating system to activate additional cooling for said microdisplay according to said temperature measurement signal.

9.   The thermal control and management system of claim 1 wherein:

said data processing means further includes a means for determining if said temperature measurement signal is within a reasonable range.

10.   The thermal control and management system of claim 1 wherein:

said data processing means further includes a means for receiving and processing said temperature measurement signal to function as a part of a Peltier thermal control loop.

11.   The thermal control and management system of claim 1
wherein:

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a data processing means generating a temperature-dependent
reference voltages most suitable for said temperature
measurement signal for operating said microdisplay system
as a liquid crystal display of a normally white mode.

12.   The thermal control and management system of claim 1
wherein:

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a data processing means generating a temperature-dependent
reference voltages most suitable for said temperature
measurement signal for operating said microdisplay system
as a liquid crystal display of a normally black mode.

15   13.   The thermal control and management system of claim 4
wherein:

said DAC are resistor digital to analogy converter (RDAC).

14.   A microdisplay system comprising:

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a thermal control and management system having a voltage
database for receiving and processing a microdisplay
temperature measurement signal for said microdisplay
system by employing said voltage database to generate a

25   temperature-dependent reference voltages for operating said
microdisplay system most suitable for said temperature
measurement signal.

15.   The microdisplay system of claim 14 wherein:

said thermal control and management system further includes a data processing means for generating a temperature-dependent black state voltage and a white state voltage as said temperature-dependent reference voltages for operating said microdisplay system most suitable for said temperature measurement signal.

16.   The microdisplay system of claim 15 wherein:

said data processing means further includes control register for loading and reading said temperature measurement signal.

17.   The microdisplay system of claim 15 wherein:

said data processing means further includes DAC output circuits for outputting said temperature dependent reference voltages.

18.   The microdisplay system of claim 15 wherein:

said data processing means further includes an interpolation means for interpolating between two data in said database for generating said temperature dependent reference voltages.

19.   The microdisplay system of claim 14 further comprising:

a temperature sensor system having a temperature senor embedded in said microdisplay.

20.   A method for temperature control and compensation for a microdisplay system comprising:

receiving and processing a microdisplay temperature measurement signal from said microdisplay system by employing a voltage database to generate a temperature-dependent reference voltages for operating said microdisplay system most suitable for said temperature measurement signal.

21.   The method of claim 20 further comprising:

said step of generating said temperature-dependent reference voltages further comprising a step of generating a temperature-dependent black state voltage and a white state voltage for operating said microdisplay system most suitable for said temperature measurement signal.

22.   The method of claim 20 wherein:

said step of receiving and processing said temperature measurement signal from said microdisplay further includes a step of receiving said temperature measurement signal into a data processing means having a control register for loading and reading said temperature measurement signal.

23.   The method of claim 20 wherein:

said step of generating said temperature-dependent reference voltages for operating said microdisplay system further comprising a step of outputting said temperature-dependent reference voltages through DAC output circuits.

24. The method of claim 20 wherein:

said step employing said voltage database for generating said temperature-dependent reference voltages further comprising a step of interpolating between two data in said database for generating said temperature dependent reference voltages.

25. The method of claim 20 further comprising:

employing a temperature sensor system having a temperature senor embedded in said microdisplay.

26. The method of claim 20 wherein:

said step employing said voltage database for generating said temperature-dependent reference voltages further comprising a step of applying a curve-fitting algorithm using data in said database for generating said temperature dependent reference voltages.